

National Climate Assessment: Potential CDR Program Contributions

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<http://assessment.globalchange.gov>



Global Change Research Act (1990), Section 106

...not less frequently than every 4 years, the Council... shall prepare... an assessment which—

- integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;
- analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and
- analyzes current trends in global change, both human- induced and natural, and projects major trends for the subsequent 25 to 100 years.

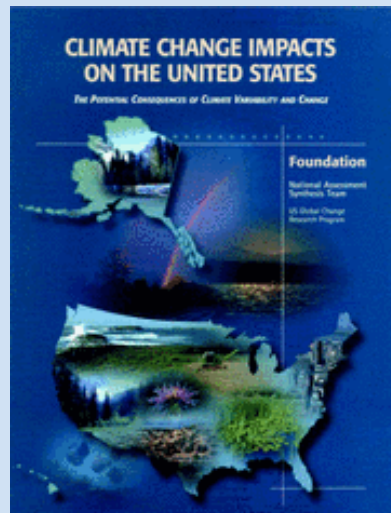


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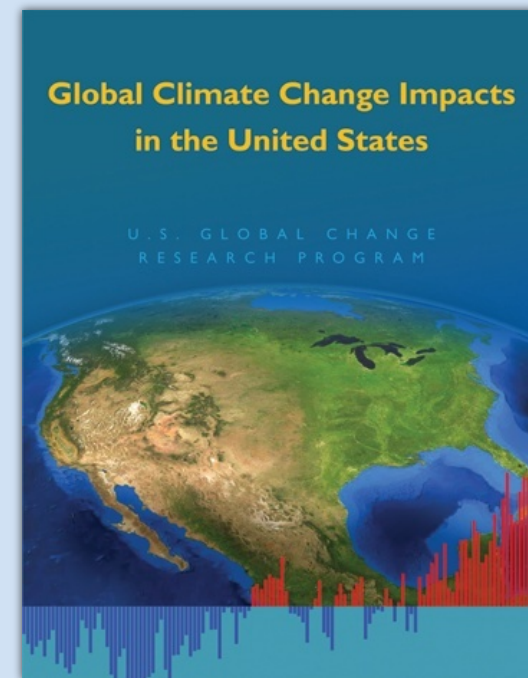
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Previous National Climate Assessments

Climate Change Impacts on the United States (2000)



Climate Change Impacts in the United States (2009)

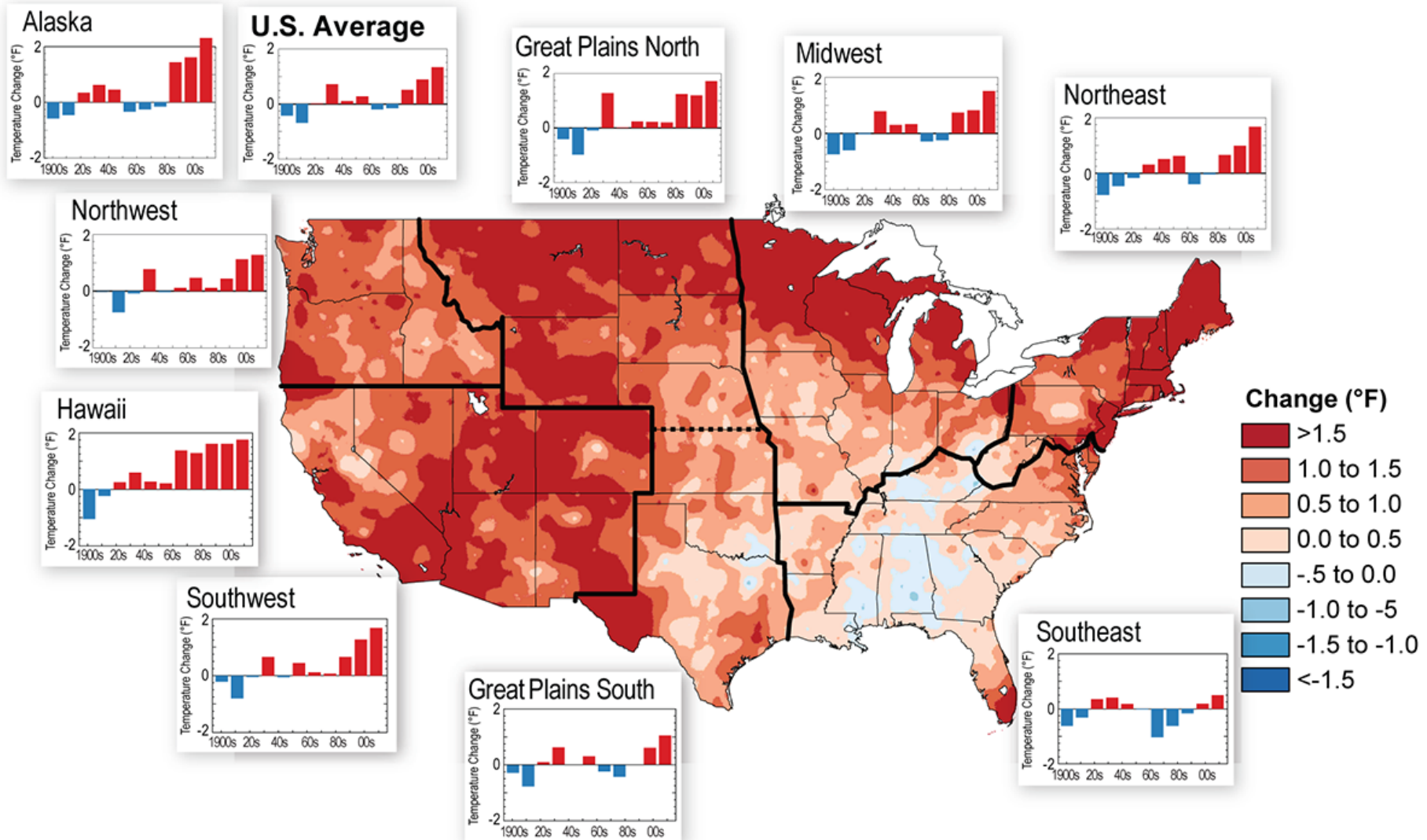


Target date for next NCA: 2014

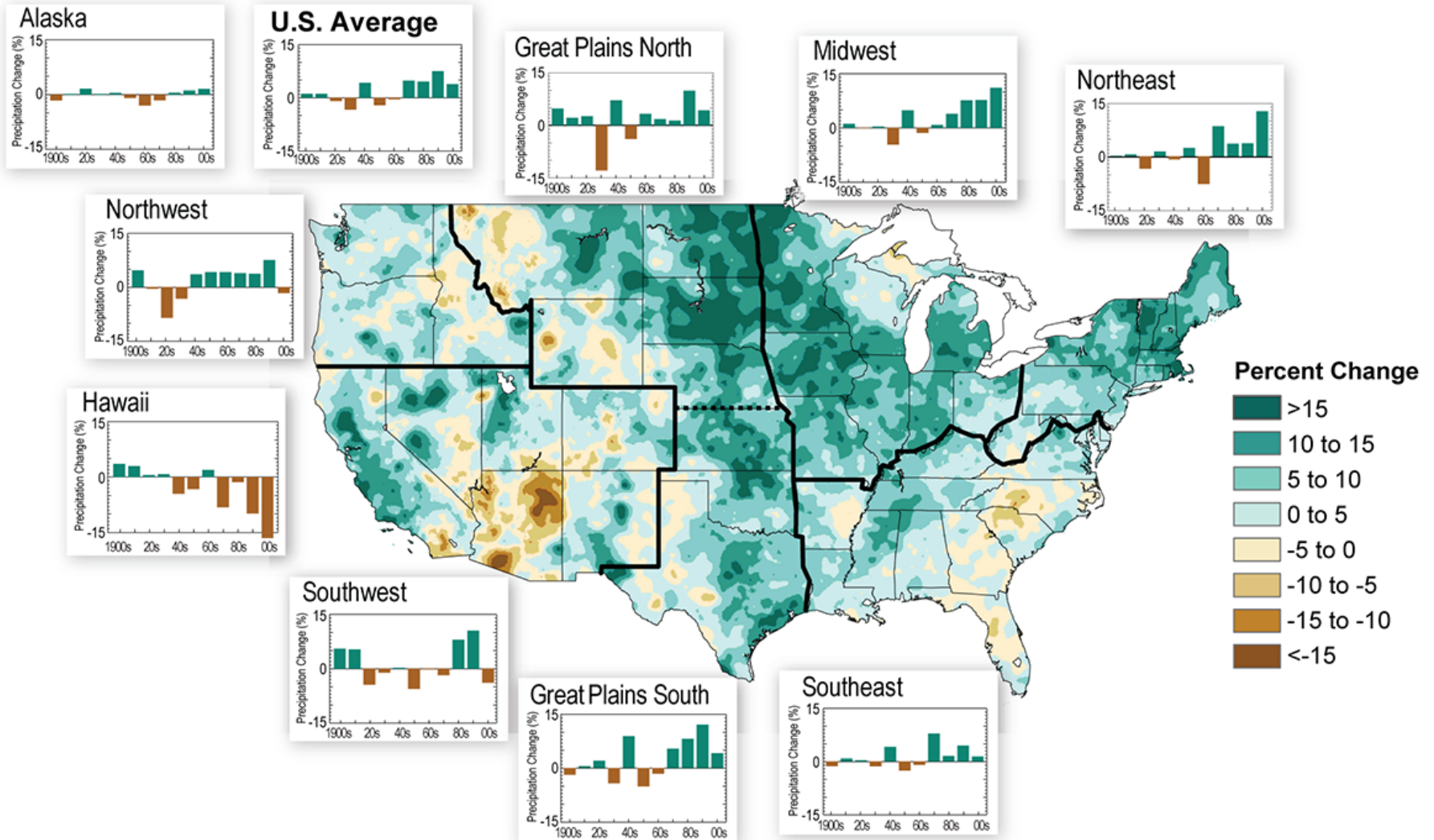
Status of NCA3

- Draft report released in January 2013 for public comment and NRC review
- Report currently under revision
- Second NRC review, review by government agencies
- Release of report in early 2014

Observed U.S. Temperature Change



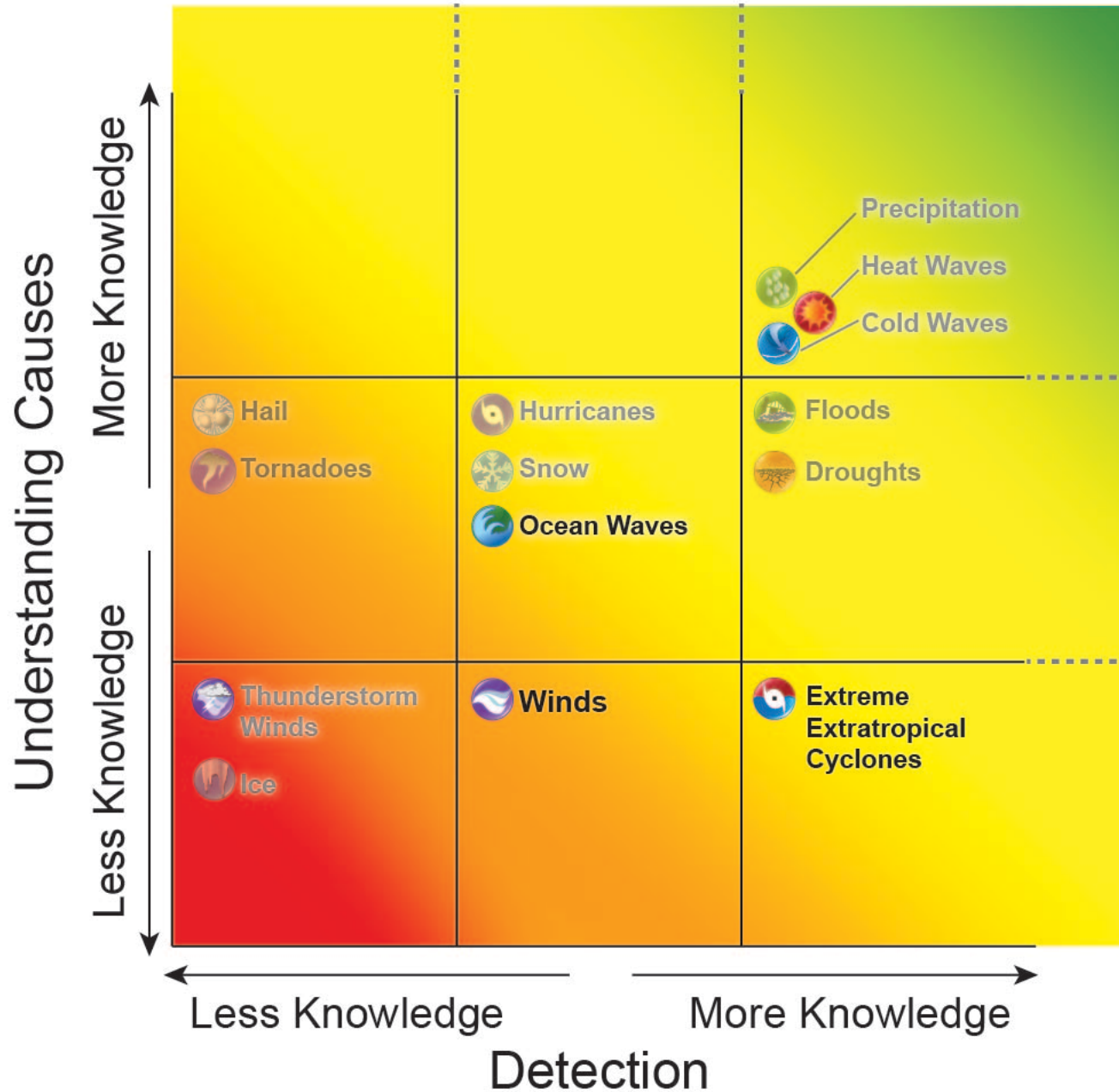
Observed U.S. Precipitation Change



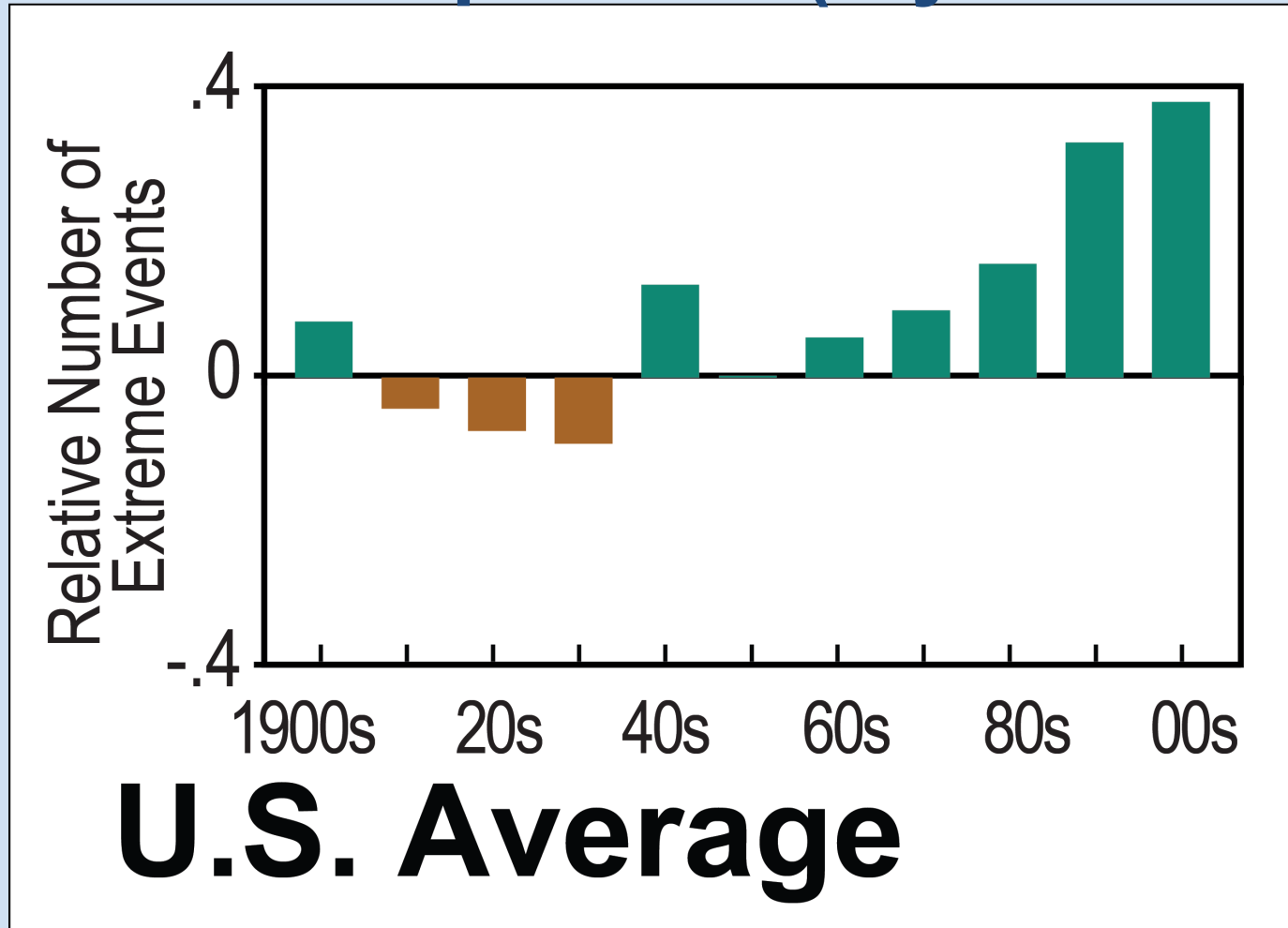
Focus on Extremes

- Extreme types
 - Heavy precipitation
 - Drought
 - Heat and cold waves
 - Hurricanes
 - Severe thunderstorm phenomena
 - Winter Storms
- Reliance on COOP network to characterize trends

Adequacy for Detection and Understanding Causes of Changes for Classes of Extremes

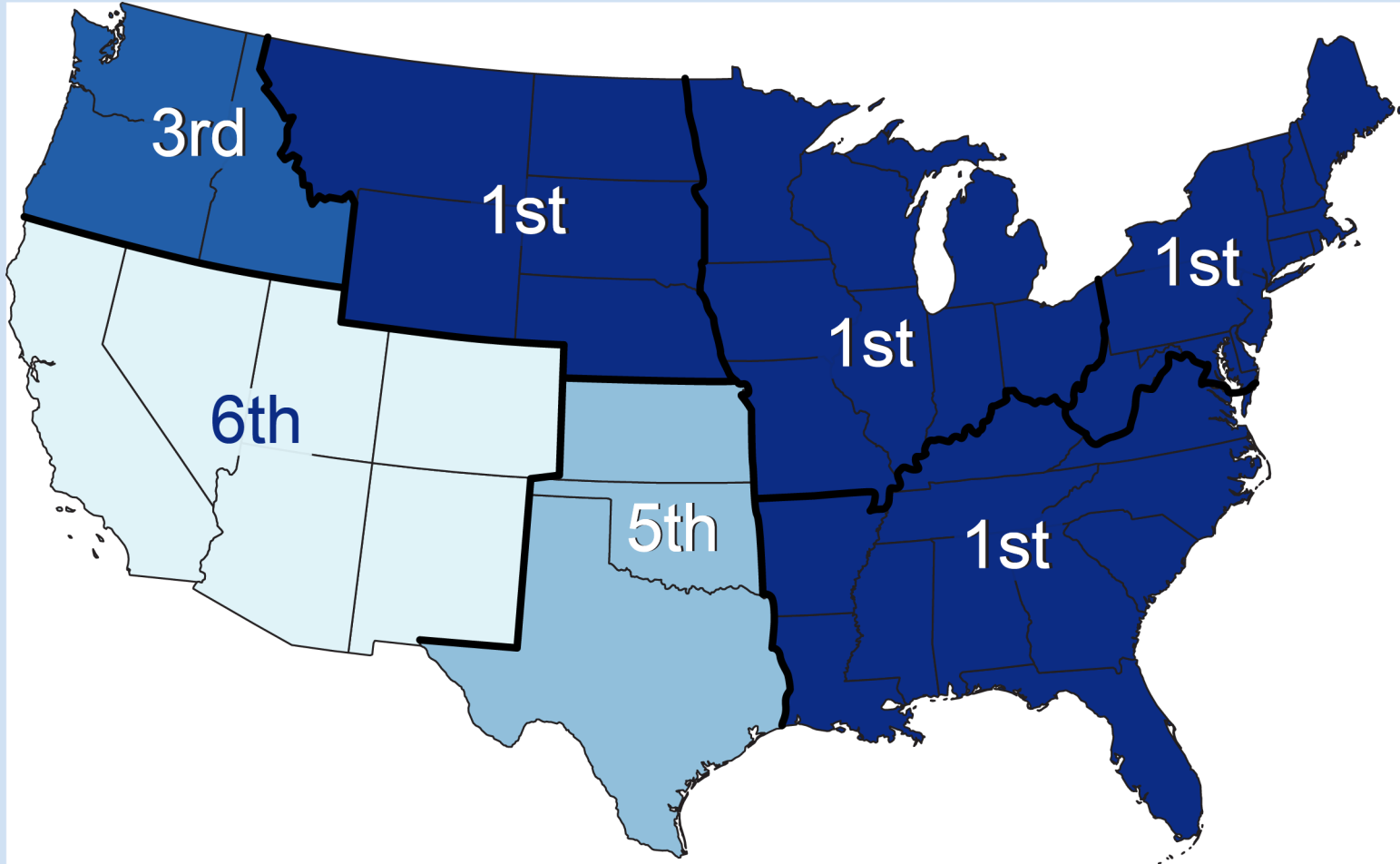


Extreme Precipitation (5-yr Storms)

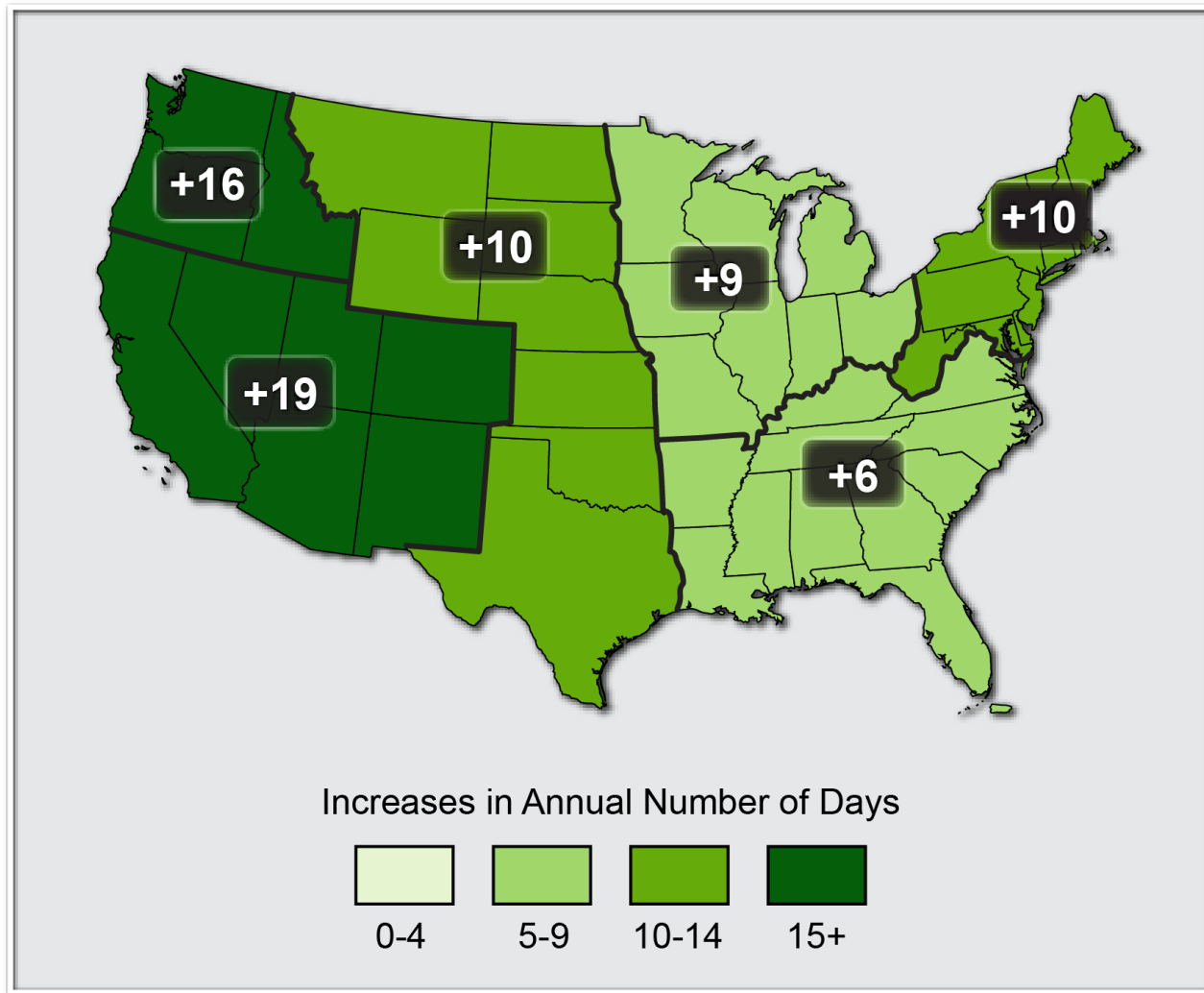


We have seen a very large increase in the number of extreme precipitation events

Rank of 2001-2011 “Decade”



Observed Changes in Frost-Free Season



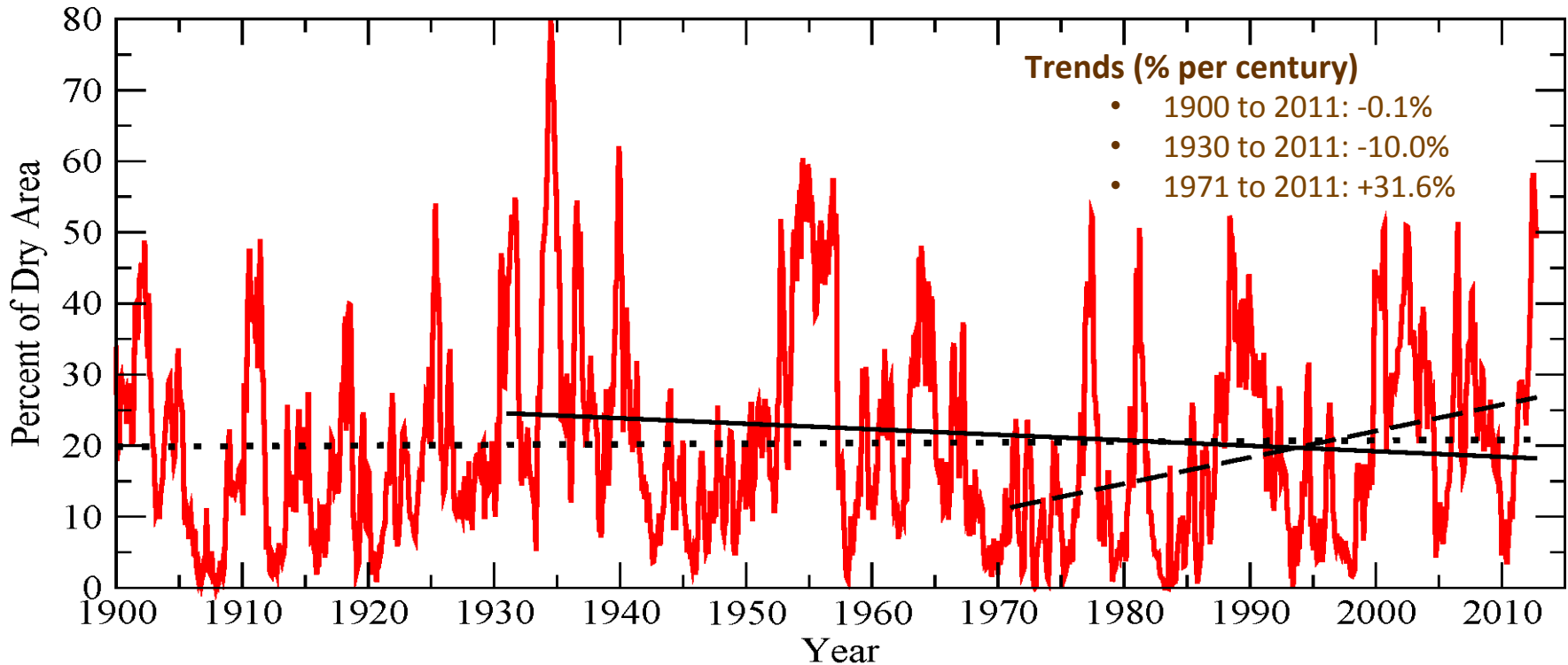
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Drought

Percent of U.S. Area in Moderate to Extreme Drought

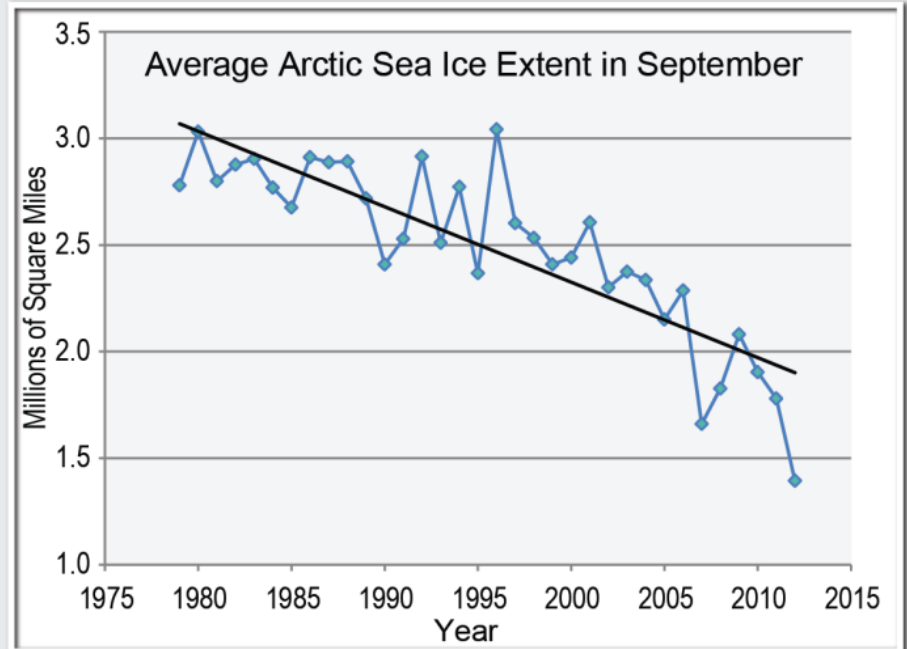
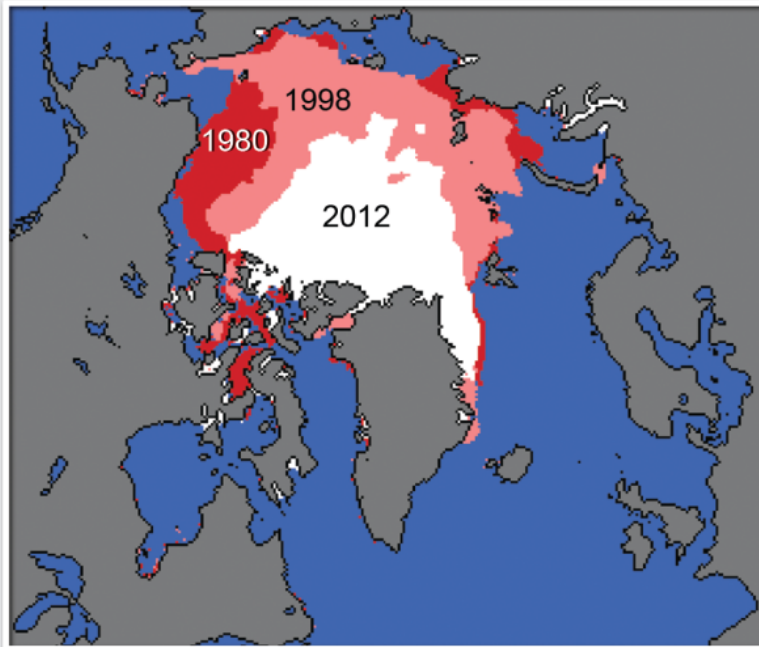
January 1900 to October 2012



- Widespread persistent drought
 - 1930s (Central and Northern Great Plains, Northwest, Great Lakes)
 - 1950s (Southern Plains, Southwest), 1980s (West, Southeast)
 - First decade of the 21st century (West, Southeast)

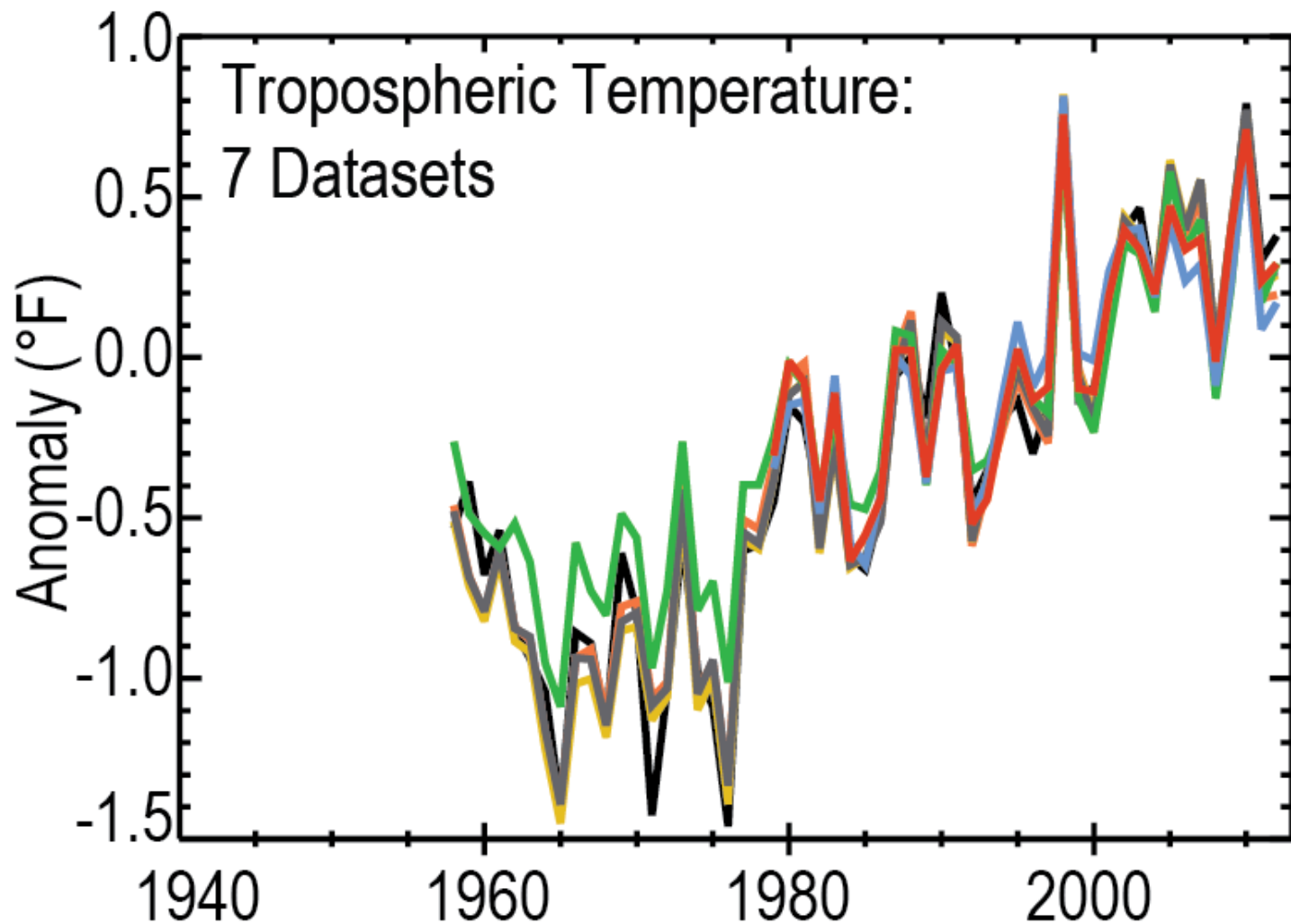
Peterson, T. C. et al., 2013.

Arctic Sea Ice Decline

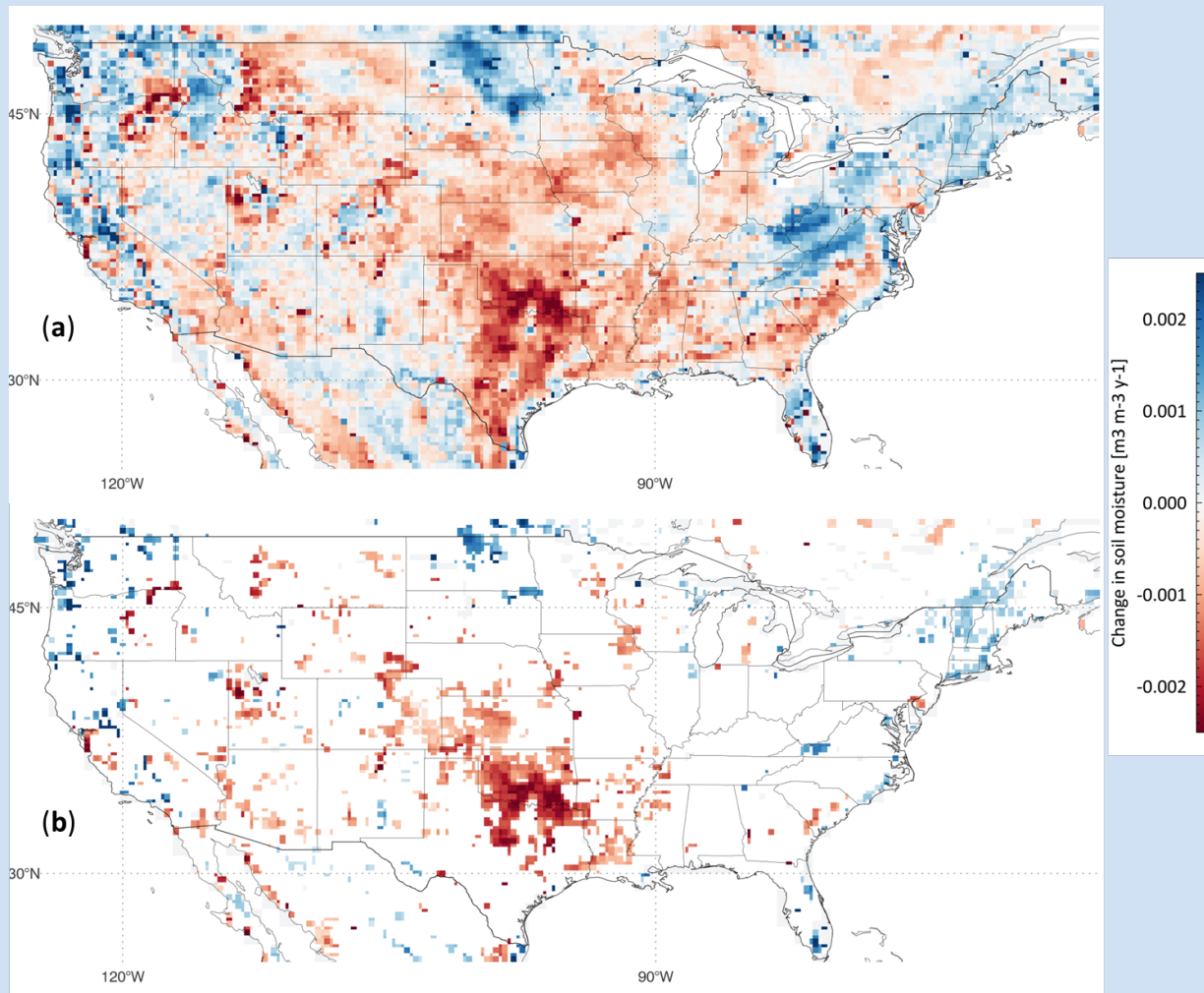


The late summer area of the Arctic Ocean covered by ice has steadily declined since the 1970s. In 2012, area covered by ice was the lowest on record.

Use of Satellite Data in NCA3

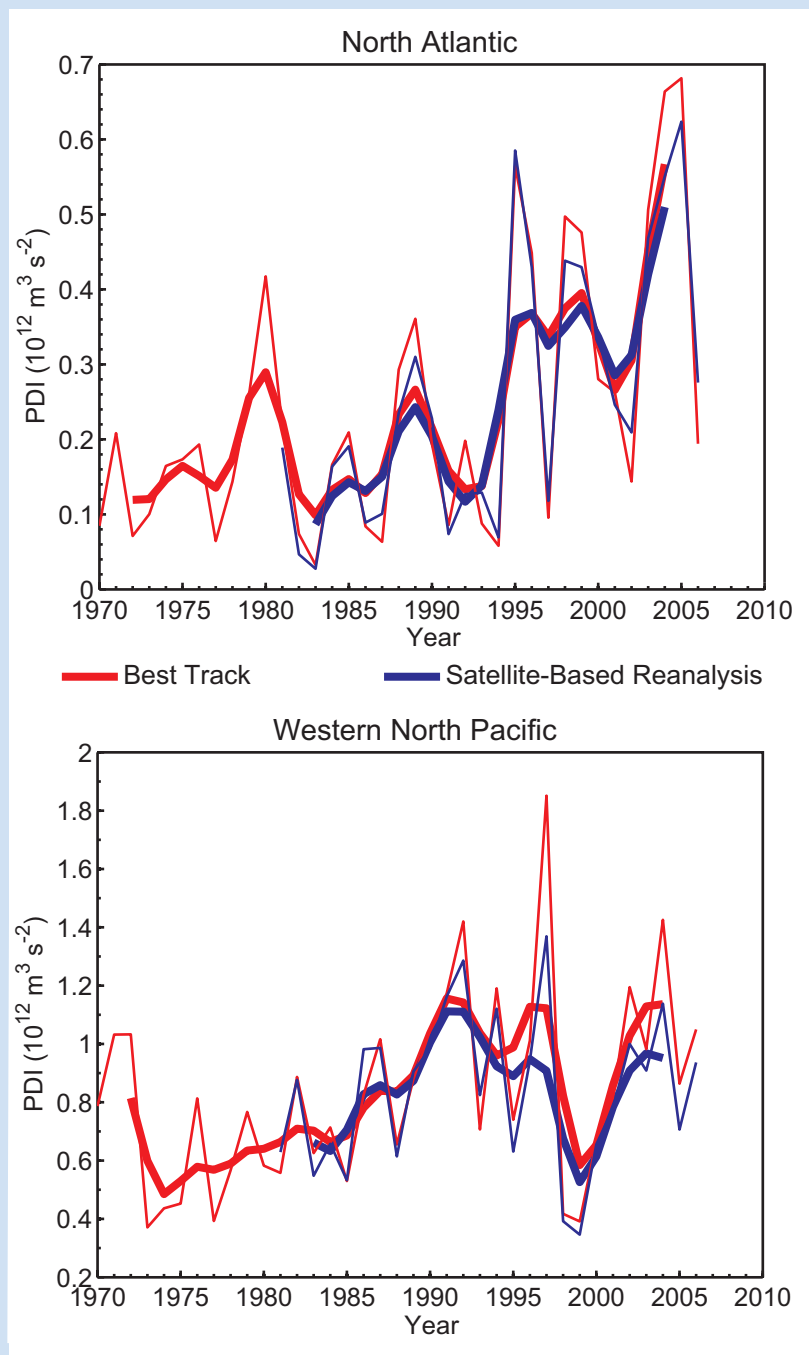


Annual Soil Moisture Trends (1988-2010)

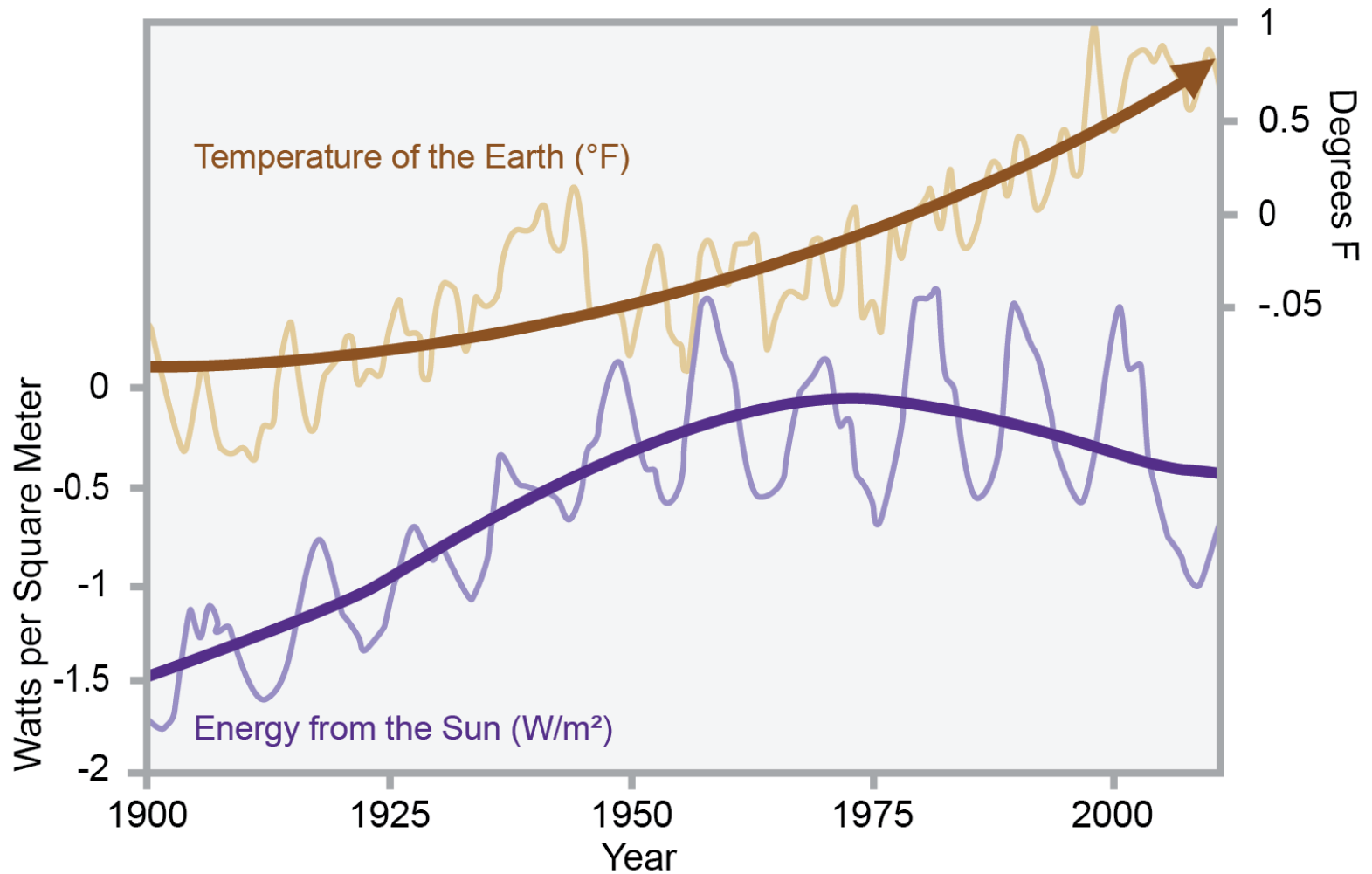


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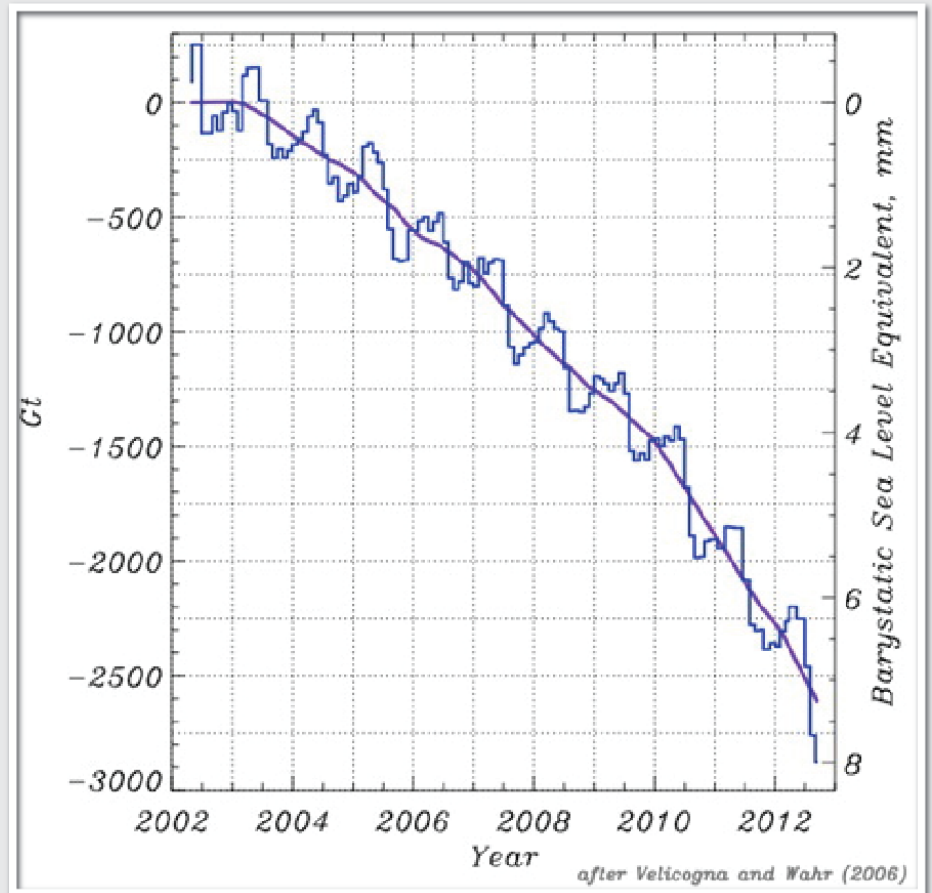
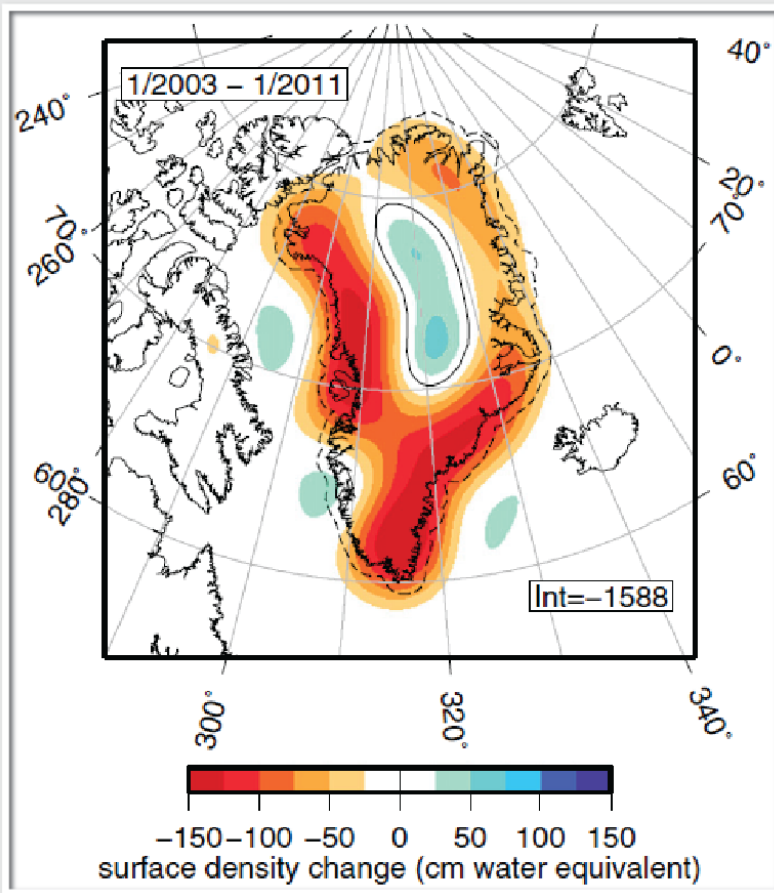
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Global Temperature and Energy from the Sun



GRACE: Greenland Ice Sheet



NCA4: What are the possibilities

- More complete characterization of **U.S.** climate trends, perhaps at NCA region level (just some thoughts)
 - Regional solar irradiance (cloud cover) trends
 - Snow cover
 - State of the land surface
 - Water vapor
- Indicators effort
- Challenges
 - Shortness of many satellite records

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